ABSTRACT

Topic: An Architecture Combining Blockchain, Docker and Cloud Storage for Improving Digital Processes in Cloud Manufacturing

When verifiable transactions between untrusted parties are concerned in a safe and reliable environment, the decentralized and tamper-proof structure of Blockchain technology is suited for a vast class of business domains, including Cloud Manufacturing. However, the stiffness of existing solutions, that are unable to provide and implement heterogeneous services in a Cloud environment, emphasizes the need for a standard framework to overcome this limit and improve collaboration. Firstly, this paper introduces a Blockchain based platform designed with Smart Contracts for improving digital processes in a manufacturing environment. The primary contribution is the integration of two popular cloud technologies within the Blockchain: Docker and Cloud Storage. Each process available in the platform requires input files and produces output files by using cloud storage as a repository and it is delivered by the owner as a self-contained Docker image, whose digest is safely stored in the chain. Secondly, with the purpose of selecting the fastest node for each new process instance required by consumers, the paper introduces a task assignment problem based on a deep learning approach.

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